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CLAIMS

1. A method for preparing mesophase pitch-based tape comprising:

extruding mesophase pitch through a slot-shaped die with an aspect ratio of 50 or more and drawing at a draw ratio greater than 5, wherein the shear rate in the die is in the range 1000 to 5000s⁻¹.

2. A method as claimed in claim 1 comprising: stabilising the mesophase pitch-based tape.

3. A method as claimed in claim 1 or 2 comprising: oxidatively stabilising the mesophase pitch-based tape.

4. A method as claimed in any preceding claim wherein the planar molecules arrange mainly parallel to the major surface of the mesophase pitch-based tape.

5. A method as claimed in any preceding claim wherein the mesophase pitch based tape is subjected to an elevated temperature.

6. A method as claimed in any preceding claim wherein the aspect ratio of the die is 60 or more, preferably 70 or more.

7. A method as claimed in any preceding claim further comprising the step of carbonisation or graphitisation.

8. A method as claimed in claim 1 wherein the die has an aspect ratio of about 50 and the shear rate is in the range 1900 to 4000s⁻¹

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9. A method as claimed in claim 1 wherein the die has an aspect ratio of about 80 and the shear rate is in the range 1700 to 4900s^{-1} .

10. A method as claimed in any preceding claim wherein the draw ratio is greater than 10.

11. A method as claimed in any preceding claim wherein the tape is of flat-layer transverse texture, said method further comprising: laminating the tape with a material capable of controlling the thermomechanical properties, transport properties or resistance to oxidation of the tape.

12. A method as claimed in claim 11 wherein the material is selected from the group consisting of fibre, ribbon, tape and sheet of line-origin transverse texture.

13. A mesophase pitch-based tape obtainable from a method as defined in any one of claims 1 to 12 comprising graphite basal planes parallel to the major surface of the tape.

14. A mesophase pitch-based tape as claimed in claim 13 having a cross-sectional area of $500 \times 10 (\mu\text{m})^2$ and exhibiting a tensile strength of about 1GPa .

15. A mesophase pitch-based tape as claimed in claim 13 heat-treated to 2700°C and having a cross-sectional area of about $8000 (\mu\text{m})^2$, wherein said tape exhibits an electrical resistivity of about $1.2\mu\Omega\text{m}$.

16. A mesophase pitch-based tape as claimed in any of claims 13 to 15 comprising a flat layer transverse texture.

17. A mesophase pitch-based tape as claimed in any of claims 13 to 16 comprising an extended graphitic plane structure.

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18. A process for preparing a bulk carbon material comprising: processing mesophase pitch-based tape as defined in any of claims 13 to 17.

19. A process as claimed in claim 18 wherein processing comprises: laminating or pressing the tape.

20. A process as claimed in claim 18 or 19 wherein processing comprises: pressing the tape.

21. A process as claimed in any of claims 18 to 20 wherein the mesophase pitch-based tape is stabilised prior to processing.

22. A process as claimed in any of claims 18 to 21 comprising carbonising or graphitising the material after processing.

23. A bulk carbon material obtainable by conducting a process as defined in any of claims 18 to 22.

24. Use of a mesophase pitch-based tape as defined in any of claims 13 to 17 in the manufacture of polymer matrix composites, carbon matrix composites or metal matrix composites.